Homework

1 a) 6 b)4 c) 2 d) 2

2 a) 47.36 round to the hundredths

b) -1.960 round to the thousandths

c) 5.6×10^2 round to 2 sig figs

d) 5×10^3

because 0.005 has only 1 sig fig

3a) 707.5 round to 3 sig figs

exactly .5 so you round to make the other digit even

708

if the question was 707.4999999999999repeating round to 707

if it is 708.5 you round to 708

708.50000000000000000000000001 you round to 709

uncertainty rules (for IB) mainly for labs

if the uncertainty is specified, use the following rules:

adding or subtracting, you add the absolute uncertainty

eg. (2.1 +/- 0.1cm) - (1.2 +/- 0.2cm)
= 0.9 +/- 0.3 cm

this rule takes precedence over the sig fig rule

eg. 2.50 +/- 0.05cm - 1.00 +/- 0.07 cm
= 1.50 +/- 0.12 so write it as 1.5 +/- 0.1 cm

ok better

Multiplying and dividing
add the percent uncertainty
eg. 2.50 +/- 0.05 cm x 1.00 +/- 0.07 cm
= 2.50 +/- 0.05/2.50 x 1.00 +/- 0.07/1
= 2.50 +/- (2% + 7%)
= 2.50 +/- 9 % percent uncertainty
= 2.50 +/- (0.09 x 2.50)
= 2.50 +/- 0.225 cm^2
= 2.5 +/- 0.2 cm^2 absolute uncertainty

range = highest - lowest

round the value to the decimal point of the uncertainty

2.50 +/- 0.225 uncertainty is 0.2 to 1 sf, so round 2.50 to the tenth
2.5 +/- 0.2

When graphing, uncertainty bars show the uncertainty on the data points

eg. 2.5 +/- 0.2 cm

at 2.5 you would have your point and draw a line from 2.3 to 2.7 to show uncertainty

Multiple trials can also be shown on the graph to indicate the uncertainty but IB requires uncertainty bars

the uncertainty in the slope and intercept can be determined using 3 best-fit lines going through the data - max line, min line and the averge

uncertainty in the slope = max slope-min slope/2